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ABSTRACT

The Operating Grants Formula utilized by the Council of Ontario Universities, has as its sole purpose to provide an objective mechanism for determining the share of the total provincial operating grant to be allocated to each university. It is not intended to limit or control the expenditure of funds granted to the universities, but institutions must be held accountable for expenditures that they might receive a "fair share" of the financial allocations. The grants formula is relatively simple, being based on weighted enrollments that produce a reasonable degree of objective equality of grants distribution. (Author/HS)

REVIEW OF THE ONTARIO OPERATING GRANTS FORMULA

Interim Report

published by
The Council of Ontario Universities

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PREAMBLE

A review of the Ontario operating grants formula was initiated by the COU/CUA Joint Subcommittee on Finance/Operating Grants in June 1971 after a specific request from the Minister of Colleges and Universities for an examination of certain factors contributing to unit costs.

Meetings were held with university representatives during the summer months. Discussions at these meetings and subsequent study led to the development of this Interim Report. The original purpose of the Interim Report was to identify the issues involved in a review of the formula and to propose a programme of study in an attempt to resolve these problems before the fall of 1972. However, with the publication of the Draft Report of the Commission on Post-Secondary Education, it was agreed that the review of the operating grants formula should be suspended until the implications of the Commission's recommendations on future university financing became clearer.

Although the drafting of a report was begun by a working group of four persons drawn from the staffs of the Department of Colleges and Universities and the Council of Ontario Universities, agreement as to content had not been reached between these parties at the time a halt was called to further work. Further, although the report has been approved by COU, it has not been put before CUA and hence does not presume to reflect the views of DCU or CUA. However, as an interim report meeting with the endorsation of COU, it is felt that its content will be a useful addition to the continuing discussion of the financing of post-secondary education in Ontario and COU is therefore circulating it to the university community as an information document.

J. H. Sword, Chairman
COU Committee on Operating Grants
May 15, 1972

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I INTRODUCTION

1. Historical background

The Operating Grants Formula was first used to determine the basic operating income of provincially-assisted universities in Ontario for the year 1967-68. The original formula document was developed cooperatively by the then Committee of Presidents of Ontario Universities and the Committee on University Affairs and recommended by the latter to the Minister of University Affairs as the major basis for public funding of the universities. The Minister and the Government of Ontario accepted the formula as the basis of funding in November 1966.

A Joint Subcommittee of the Committee on University Affairs and the Committee of Presidents (now the Council of Ontario Universities) was established to consider problems of interpretation and definition which arose in the course of applying the formula and to consider adjustments necessary to meet circumstances which were not envisaged when the original document was prepared. Most of the adjustments have been matters of simple housekeeping or administrative interpretation. Others, in particular those associated with counting graduate students and limiting entitlements have involved substantive changes in the formula itself. Other major adjustments were increased weights for medical students and interns. In these cases the formula has been made responsive to major changes in academic reality, i.e. the need to accelerate completion of graduate programmes, and to recognize greatly increased costs of medical education associated with larger numbers of full-time teaching faculty in clinical medicine. Such responsiveness was clearly intended in the recommendation of the original document that means should be found for "continuing study and regular review of the formula system...to ensure continued confidence in its efficiency".

On the other hand it was originally assumed that the AUCC cost study then getting under way would provide information upon which revision of the weighting system might be reliably based. The detailed cost information which this study was expected to produce did not materialize. Although the formula weights were structured to reflect "roughly the relative costs of the various types of instruction offered" and it was assumed "that no exact relationship is possible or necessary", the lack of cost information originally expected has contributed to a feeling that the weighting system needs overall review. Indeed, a trial period of three years was envisioned after which the formula might require major changes.

Questions have also arisen about the basic principle of a formula designed to produce income for universities without affecting their freedom to make individual decisions about spending. Perhaps there are alternative methods of funding the universities of Ontario which

would be more appropriate for the future. A specific impetus was given to the present review by the statement of the Minister of University Affairs in April, 1971, that a study of the formula should be carried out before he would be prepared to act on a recommendation for the level of operating support in 1973-74.

To proceed with the review, the Joint Subcommittee on Operating Grants/Finance established a working group of four persons drawn from the staffs of the Department of Colleges and Universities and the Council of Ontario Universities. The working group began its work during the summer of 1971 with a series of informal meetings with senior officers of each university to discover present attitudes about the formula and areas of satisfaction and dissatisfaction with its operation.

2. Objectives of the interim report

The purposes in presenting an interim report at this time are to identify for members of the Committee on University Affairs and the Council of Ontario Universities the main issues raised during the meetings with university representatives and to propose methods for dealing with these issues.

The Joint Subcommittee is aware that the Draft Report of the Commission on Post-Secondary Education contains recommendations for the future funding of universities which should properly be taken into account in any study of alternatives to the present formula system. The working group feels that it should defer further review of the formula until debate on the Post-Secondary Commission's Draft Report is completed. It is assumed that any major overhaul of the present formula or its replacement by another system of providing operating funds to universities could not be implemented before 1974-75 at the earliest. Also, since the Subcommittee does not now know what form a future formula will take, it must write this report as if the present formula, with revisions, may be required to serve us beyond 1974-75.

3. Basic principles

Possible changes in the formula for application in 1973-74 should therefore be tested for consistency with the basic principles of the formula. These can be summarized as follows:

a) The formula is a grants formula, not a formula for internal budgeting. In other words the sole purpose of the formula is "to provide an objective mechanism for determining the share of the total provincial operating grant to be allocated to each university...it is not intended to limit or control the expenditure of funds granted to the universities.

The sole purpose is to determine...basic operating income". (The word "formula" is often used in other jurisdictions to denote the method by which funds are allocated to universities. In most cases such formulae are micro in form and involve detailed judgements about budgeting of specific university activities. The Ontario formula, on the other hand, leaves internal budgeting and management to each university.) In Ontario, the weights assigned to various kinds of students are not meant to imply that they are "norms" of relative costs per student.

b) The Ontario formula aims for simplicity by means of "a relatively simple pattern of weighted enrolment" to "produce a reasonable degree of objective equality of grants distribution" in a manner consistent with university autonomy.

c) "The formula reflects roughly the relative costs of the various types of instruction offered, but it is felt that no exact relationship is possible or necessary". A scale of weights which is intended to produce "rough justice" only is a corollary of the objective of simplicity.

d) The original formula document also recognized the need to guard against "the danger of producing serious distortion in the income of one or more universities through the inaugural phase of the formula system". The avoidance of such distortion in applying changes in the formula in a single year is an essential principle for the future as well.

A great deal of care must be taken to distinguish between two different kinds of problems in university financing. On one side is the question of how to distribute money to the universities, a question which is answered by a grants distribution formula. On the other hand, there is the necessity of assuring that universities are held accountable for their expenditures. Universities must provide this accountability as the government has a responsibility to the electorate for the spending of public funds on programmes authorized by the legislature. It follows also, that universities cannot expect to receive "a fair share" if they do not provide necessary information for government's justification of this fair share to the electorate.

In our view accountability cannot and should not be provided through the mechanism for distributing operating grants. The present formula was never intended to be used as a device for determining patterns of university expenditure or "steering" funds to meet changing social demands. Accurate record-keeping systems coupled with a proper financial reporting subject to audit should ensure that university funds derived through the formula are allocated to the objects for which the university exists. (It is appropriate to

note here that the Ontario university financial officers are making substantial progress in developing "programme-oriented" financial reports).

The formula as originally designed was intended "to give universities maximum incentive for effective management". But, of course, there are no sanctions in the formula which guarantee either effectiveness or efficiency. The presumption was that effectiveness and efficiency are more likely to be achieved by allowing each university to administer its own income in the light of individual circumstances than by attempting detailed direction and control from the centre. It is implied therefore that efforts by the provincial government to improve efficiency in the university system should arise mainly through adjustments to the level of funds rather than through adjustments to a distribution formula.

The formula document recognized, however, that the government's responsibility might require it to limit in a general way the purposes for which formula income could be spent - but regulations specifying such limits were "a separate matter" and not part of the formula itself. Such limitations involved, for example, a prohibition against use of operating funds generated under the formula for purposes of graduate and undergraduate student aid. Since the government's student aid provisions were funded under another programme and based on specific policies determining the kinds and extent of aid to be made available to students it would have been anomalous to allow public monies generated by the formula to be applied in overlapping and possibly contradictory ways. Similarly, the Minister, on the advice of the Committee on University Affairs, has placed limits on the kinds of programmes in which students could be counted for formula purposes. These are two of several instances in which the government has set limits to the open-endedness of the formula. It may be deemed necessary in future to extend these limits in relation to overall numbers of students in various categories. Such limits, consistent with government accountability to the electorate do not, however, affect the basic design of the formula as an income generating device.

An adequate level of financing depends on the provincial government policy on the amount it is prepared to allocate to university purposes. Although it is sometimes difficult to divorce considerations of a desirable or acceptable level of financing from those of distribution of funds, the present formula is only concerned with the problem of an equitable distribution. This review will not consider explicitly the question of the level of financing.

II MAIN ISSUES IN FORMULA REVIEW

The first step in the review was to institute a series of informal meetings between the working group and representatives of each of the universities to learn their feelings about the present formula, their concerns for revision, and their suggested methods of approach to the review. It was felt that a series of consultations with the universities would be more fruitful than formal submissions for identifying the main issues.

All universities agreed that a distribution formula of some kind is desirable and that the present formula had worked reasonably well in distributing operating funds. There was some concern whether the formula as presently constituted would be as appropriate for the future period of decreasing enrolment growth rates. Several representatives commented that they saw no necessity for substantial revision of the formula but the majority thought there was room for improvement. However, they emphasized that the onus should be on the proposers of changes to prove that any suggested revision would represent a significant improvement. Any concerns about whether justice was in fact being done by the formula seemed to be offset by the general satisfaction that it was at least seen to be done by virtue of the rules being common knowledge and applying equally to everybody.

With respect to the present formula's equity, there was understandably considerable uncertainty on the part of most representatives, since

(i) some universities, being still in the emergent phase, had not experienced operating on unsupplemented formula grants;

(ii) most had not developed programme costing to an extent that would permit an objective evaluation;

(ii) for quickly growing institutions, a greater degree of budgeting flexibility is possible than for institutions at or near steady state, and the equity question is therefore harder for them to judge;

(iv) latent inequities could have gone unnoticed because of the relatively generous increases allowed up to the past two years in the value of the basic income unit;

(v) it is often impossible to tell for sure whether an institution's relative prosperity under formula is due mainly to weighting anomalies or to the effectiveness of its management of resources;

(vi) feelings about the equity of the formula could easily be confused with the contentment that comes from having successfully adapted to it.

There appeared, nevertheless, to be consensus that some inequities of one kind or another were an unavoidable feature of any system of formula financing, and that in the present Ontario system there were no gross inequities. There was also a general consensus of opinion on the main issues of formula review.

Even though it will only be possible to deal with a few of the most important immediate issues in this short term review it is useful to summarize the main issues developed in our meetings with the universities.

1. Mechanism for transition to a new formula

Any real change in the formula will mean that there will be a shift in the distribution of resources among the universities. Therefore, by definition, some universities will forego portions of future income that others pick up. While it is desirable that universities adjust to any new formula as quickly as possible, some mechanism must be devised to ease the transition for universities adversely affected under a revised formula.

A suggested method for phasing-in a revised formula is as follows. The Minister's announcement in March could indicate the total resources available for distribution and what the value of the BIU would be if the original formula were still in effect in the following year. In addition, he could guarantee that the actual amount that a university would get would be a minimum of say, 90% of actual incremental income under the old basis plus normal escalation of the previous year's units. Those universities that gain by formula revision would be subject to the same limitation in the increase that they would receive in the following year. In other words, those who lose would be supporting those who gain and there would be no change in the total grants to all universities.

In subsequent years, when a completely revised post-secondary system may be in force, a similar phasing-in procedure would be highly desirable.

2. Role of cost studies

If it is considered appropriate that the weights of a programme-related formula should represent approximate measures of the relative costs of the programmes, it would only seem logical that the development of a programme costing system would provide an ideal means for arriving at a set of weights or justifying existing weights.

What is involved in the development of a programme costing system? A first and most important step is to establish definitions of university programmes and a suitable programme structure. Existing programme definitions, which rely on discipline groupings as a basis

for a programme structure, are not appropriate for inter-disciplinary activities and non-instructional activities. There are also problems of allocating costs incurred in the department/faculty structure to the proper programme categories. In the case of certain direct costs, this is a straightforward step. However, in the majority of cases, joint costs will have to be broken down in an acceptable manner before allocating them to a particular programme. For example, a professor may teach students enrolled in some programmes, and may undertake research and administrative duties which are parts of other programmes. His salary must be distributed to all of these programmes in a way which reflects the proportion of his effort allocated to these different programmes. Throughout the university there are a number of overhead costs shared jointly by a number of programmes which would have to be arbitrarily divided among the programmes. Even when these arbitrary decisions have been made, useful programme costs will only be provided when an on-going system for producing the department/faculty cost information in a suitable format for the re-allocation process exists. It should be said here that many informed observers do not believe the costs of maintaining such systems justify the benefits.

At the present time, no acceptable programme costing system exists in a university or university system although numerous one-time cost studies have been undertaken, e.g., AUCC, and the University of Calgary cost studies.

The methodology for these systems has not been adequately developed. For example, the results of the AUCC study have been widely discounted, partly because the findings were based on many arbitrary assumptions. A great deal of time is necessary for developing these systems as they are complex and require experience and adaptation. The work in this area at both Ohio State University and the University of California was initiated several years ago and full implementation is not evident yet. Given the state-of-the-art of programme costing in the Ontario system, there is no possible way of obtaining reliable programme costs in time for these to be used for this review of the operating grants formula.

The premise implicit in the present formula is that costs of similar activities will vary from university to university and that such diversity, far from being something to be corrected, is to be expected. Universities are accountable through their governing bodies for allocating resources in the way best designed to serve their institutional objectives. The government can, either directly or through the Committee on University Affairs, seek to influence those objectives in both negative and positive ways some of which involve the eligibility of certain kinds of enrolment for formula entitlement. But the deployment of resources, whether obtained through the formula or from private sources, is beyond the scope of the Ontario formula.

The Joint Subcommittee believes it important that the efforts now beginning towards the development of a uniform programme costing system for Ontario universities through the Committee of Finance Officers - Universities of Ontario should be given every possible support and encouragement by the province. The advantages to be obtained if these efforts are successful extend far beyond any subsequent formula revisions. Administrative effectiveness should be greatly enhanced by the opportunity provided to university administrators to make valid comparisons of their relative costs of output and to understand the reasons for differences. Accountability will certainly be advanced, because in constructing a programme costing system we will have to confront and overcome the inextricably mixed nature of university employment as well as many other problems of poor accountability resulting from obscurity as to where responsibility rests. Finally, if the universities can be assured that their autonomy will not be unduly threatened by disclosure to government or to the Committee on University Affairs, uniform programme cost information will be extremely useful to those responsible for master-planning.

In place of programme costing for relative weighting there are alternatives - alternatives which are not as "ideal" as a programme costing system, but which have many merits. One such alternative which appears most attractive is to use informed judgement in a structured manner to derive the weights appropriate for programme categories. This technique, known as the "Delphi technique" was developed at RAND Corporation and is now gaining widespread acceptance by business and government as a tool for obtaining consensus opinions on difficult questions e.g., prediction of future technological developments. The Delphi technique calls for an initial questioning by questionnaire of "experts" i.e., people most concerned with the unknown information. In this case the unknown information is the weight to be assigned to a programme. Selected members of the university would be asked to suggest weights for programme categories. Their answers would be accompanied by brief supporting explanations which would reflect either analysis of the problem which had been undertaken in a university or simply intuition. These answers would be tabulated and the "experts" requestioned after being supplied by the investigator with feedback derived from the first round of questioning. The process of requestioning is designed to eliminate misinterpretation of the questions and the feedback, and to bring to light any knowledge available to one or a few members of the group but not to all of them. The additional round of questioning would narrow in on a consensus opinion as the second-round answers would be based on additional information. The object of keeping the experts apart geographically is to guard against the bandwagon effect - the tendency often seen at meetings of arriving at a presumed consensus which represents, in reality, the opinion of one or a few of the more aggressive or prestigious participants.

This technique seems to offer some advantages over a programme costing system. Programme weights would be determined by a consensus opinion rather than by "data manipulation". This seems to be extremely important in the university environment where there is concern not only for what cost allocations have been but what they ought to be.

Results of cost studies which we know have been and are being carried out at certain universities would no doubt be reflected in the answers of the participants to the questionnaires.

Adoption of the Delphi technique by the universities and the government as an acceptable means of revising formula weights would seem to imply acceptance by both in advance of whatever weighting scheme emerged in the final consensus. Hence, the Delphi technique, if accepted, would likely become the one and only approach to formula revision.

An essential preliminary task which must be completed before application of the Delphi technique can begin, is to re-examine the present formula list of programmes in order to amend it so that each of the current curricular offerings of the universities can be classified naturally under one item or another of the amended list.

3. Scale and linearity of costs

The type of programme alone does not determine relative cost. Other considerations such as scale and mix of programmes will have some influence on the costs of a university. The Ontario system has already acknowledged a relationship between size and cost in its emergent grants to those universities having fewer than 4000 BIU's. But above that point, total costs are assumed to vary directly in proportion to the number of basic income units at a university. This is an over-simplified view of the relationship of total university costs to size of student population. Intuition would indicate that it is only an approximation to the actual cost functions.

Certain costs of university operation are fixed costs e.g., part of the central administration, part of the physical plant, part of the library system. Other costs may vary with the number and type of programmes e.g., high development costs of a new programme, desire of an institution to have a large proportion of the more expensive (science, professional, graduate) programmes. Many costs do vary depending on the number of students at the university but not necessarily in direct proportion. As student population grows there is an increased demand for a larger variety of course offerings.

This necessitates the addition of extra teaching faculty which in turn may tend to proliferate the number of course offerings. Some academic costs, physical plant costs and administrative costs may remain constant for small increases in the size of the student population. However, larger increases in student enrolment would necessitate jumps in these costs as new teachers are hired, new buildings are built, maintenance costs rise, and registrar's office operations expand. At first appearance, it would seem that costs as a function of student population would rise in a non-linear stepped pattern.

If this is the case, are there any significant economies of scale? If so, should the formula incorporate these? As the university expands in size there will be some economies of scale as it proceeds toward the base of one of the quantum jumps in the cost function. As it expands past the size where such a step occurs on the cost curve there are counteracting diseconomies of scale whose effects would be decreased as the university grows towards the base of the next step.

The above discussion has assumed that there is a cost curve for a university and that it is possible for this to be determined. It is very doubtful that there is one curve relating cost to institution size for all institutions and it would be virtually impossible to attempt to isolate and measure such a function. There are so many other factors affecting costs that it would be difficult to identify and separate these out.

However, this does have importance for the review of the operating grants formula. If costs do not vary directly in relation to size of student population and type of programme (to which the basic income unit is directly related) we must determine whether the assumption of linearity in the formula is a reasonable approximation to the shape of the cost curves. We must attempt to get some insight into the relationship of cost to size. Exact cost curves may not be necessary. We can attempt to examine how some of the major cost components might vary with size by suggesting alternative models and doing some spot tests. Such questions could also be subjected to an organized test of informed judgement under the Delphi system.

The University of Bradford in the U.K. has recently completed a major study of costs, their interrelationships, and potential economies. Although the study was done for a specific institution some of the methodology has more widespread applicability. Part of the work included a cross-sectional study of the economic costs of all undergraduate courses in 1969-70. The results of this study suggest that some economies of scale do exist at that particular institution.

If linearity with respect to BIU's does not seem to be a reasonable approximation to the cost function this should be reflected in the pattern of operating support given to the universities. Either additional factors will have to be built into the formula or the non-linearities will have to be taken into account in extra-formula funds.

A special kind of cost problem is faced by universities approaching the steady state. There is a serious question about the extent to which the original formula was designed to serve a system in which all universities were expanding and the modifications it might require as growth in several institutions levels off and they approach stable levels of enrolment. It is argued that quickly growing institutions have a greater degree of budgeting flexibility than those of limited growth. This question was not considered in the formulation of the formula. It could perhaps be argued that differences in rates of growth are like other categories of difference and that the formula was designed to allow universities to meet their individual problems in ways they found best. However, institutions whose growth is coming to an end do face a serious problem in the number of faculty to whom obligations exist. As a very large body of relatively young faculty recruited during the period of rapid expansion from 1965-70 grow older and gain seniority the average salary will rise most quickly in those institutions which have stopped expanding and are bringing in relatively few younger faculty at lower salaries. Since academic salaries and fringe benefits account for between forty and fifty percent of all university budgets, slow growing institutions will be at considerable and increasing disadvantage.

4. Different bases for funding

The above discussion leads to the wider question of the best basis for a formula: weighted students, another basis such as student contact hours, or a combination of different bases. The main advantage of the weighted student basis is that it is a broad approach allowing an individual university a great deal of flexibility in its internal budgeting procedure. In addition, it is a formula which is simple to understand and which doesn't require an excessive amount of detailed data to be collected for its operation. It can and has worked successfully without accurate programme cost information. A number of other bases have been suggested as possibilities for use:

Student contact hours: This may provide a better approximation of teaching costs than student numbers. Combined with class size information student contact hours reflect the faculty needed for teaching more precisely than do student enrolments. Implementation would require a massive data collection system and it does not provide for non-teaching activities.

Student enrolment by year or level: On this basis, weights would be based on student numbers in a programme in a particular year. This assumes that the costs associated with different

levels of instruction are significantly dissimilar. Although this may be true, it would be very difficult to assign weights on this basis. With the trend towards elimination of specific years of university and an increase in part-time enrolment, this system would prove to be almost impossible to implement.

Output: This is only a vague notion because the measurement of output is only possible in certain cases. For example, one output of a university might be the number and type of degrees which it distributes. The idea is meant to promote cost efficiency in producing a degree. This approach neglects the process of producing the "output" which is where the cost is generated. It also ignores other valuable university outputs not necessarily related directly to degrees produced.

Will these factors approximate the true cost relationship better than the number and type of students? They may but probably at increased cost of data collection. One of the major drawbacks to these bases is that they produce more complex formulae requiring greater quantities of data. In addition, they allow greater government control over more detailed information.

For example, let us examine a more detailed formula and its implications. Similar formulae were outlined in the CUA/COU Joint Subcommittee on Operating Grants report on Financing University Programmes in Education, in A Method for Developing Unit Costs in Educational Programmes by I. W. Thompson and P. A. Lapp, and in the draft report of the Ontario post-secondary education commission.

Assume that the following formula represents the total cost of instruction in a programme and that this would be the basis for deriving programme weights. Also assume that academic salaries are the only component of instructional cost.

$$\text{Total instructional cost of programme} = \text{No. of students in the programme} \times \text{Staff-contact hours per student} \times \text{Cost per staff-contact hour}$$

Expanding this equation:

$$\text{Total instructional cost of a programme} = \text{No. of students in the programme} \times \left[\frac{\text{Class-hours per week per student} \times \text{No. of wee}}{\text{average section size}}\right.$$

$$\left. \times \left[\frac{\text{Average annual salary of professor} \times \text{Proportion of his salary derived from teaching in the programme}}{\text{No. of weeks} \times \text{Staff contact hours per professor}}\right]\right.$$

If we cancel out the "Number of weeks" in both the numerator and the denominator,

$$\text{Total instructional cost of a programme} = \frac{\text{No. of students in the programme} \times \text{Class hours per week per student}}{\text{Average section size}} \times \frac{\text{Average annual salary of professor} \times \text{Proportion of his salary derived from teaching in the programme}}{\text{Staff contact hours per professor}}$$

Such a formula may prove very satisfactory at the institutional level in attempting to obtain information on programme costs. But at the level of a provincial formula for funding universities, a new series of problems are encountered. Of the six factors in the last equation, adequate data are presently available at the system level for only two of them: number of students and average section size. There are two ways of filling in the remaining data. Either the government could force the universities to supply the data or it could unilaterally decide on "reasonable" values for these parameters from which a "reasonable" direct funding level by programme could be established. The first method requires that universities have operational programme costing systems in order to produce the cost data needed. It would also represent a major step in further disclosure of university information to the provincial government. By the second method, the government would specify what it is willing to fund in terms of student contact hours, staff contact hours, average salaries per professor per programme, and the division of effort of a professor's time. Until the present, these have been matters of academic policy and of direct concern to the professor and his university. The naming of reasonable values for these parameters by the government would represent direct intervention into academic policy considerations. Audit procedures would have to be expanded, especially into academic areas. This formula is also noteworthy for the university activities that it excludes presuming as it does that all university goals are served by contact hours in the classroom.

A number of different formulae using different bases are in use in the United States. Most of the American formulae are more complex and use much more disaggregated data. This is probably in keeping with the greater degree of legislative control of universities which exists in many states. However, some involve large quantities of data as well as many simplifying assumptions

about cost relationships. Analyses and assessments of many of the American formulae are found in a Ph.D. thesis by W.J. Stumph at Southern Illinois University.1/

Another way of funding would be to form institutional weights. An institutional weight would be a gross weight based on the projected mix of students and programmes in a particular institution. Such a system might work as follows: each university would present its enrolment projections in various programmes to the Committee on University Affairs for a period of two or three years. These projections would represent the intended plan of activities for the university. (A five year projection is now presented and revised each year as the basis of capital funding.) Submission of this plan would provide an opportunity for the Committee on University Affairs to review the proposed activities of the institution and to say whether or not these were consistent and compatible with province-wide needs when related to the activities of other universities. Once the projection was approved a single weight would be assigned to the institution for the period in question. A university would be expected to maintain enrolments as close as possible to the projections although some normal variation would be permitted. The university would be entitled to receive the institutional weight for each full-time equivalent student registered in each year. At the end of the period the performance of the university would be reviewed along with a plan for the next projected period of time. The weight might then be altered in either direction depending not only on the mix of students projected but also on past performance. This procedure would obviously involve a review of activities on the part of the Committee on University Affairs and this review would play a part in its recommendations to government.2/

5. Extra-formula funds

Since 1967-68 operating funds have been split into formula and extra-formula portions with the former distribution according to weighted students and the latter for special support. Extra-formula grants have been provided to universities that have not achieved viable enrolment levels, for support of major new

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1/ W. J. Stumph, A Comparative Study of Statewide Operating Budget Formulas Administered by Statewide Coordinating Agencies for Higher Education in Selected States (Carbondale, Ill., Southern Illinois University, Graduate School, 1969).

2/ This system would require much more of the CUA in planning review and approval and it is difficult to see how they could deal effectively with the situation where an institution's weight needed lowering. As it is now the institutional weight responds to enrolment - not to a planned change.

programmes at various universities, and for support of bilingualism and trimester operations. The distinguishing characteristic of extra-formula financing is that it is related to special needs which cannot conveniently be correlated with weighted students. There has been a conscious effort on the part of government to bring these special grants to the irreducible minimum. Unless present plans are altered it is estimated that in 1972-73 extra-formula grants will amount to about $5 million. In the first year of operation of the formula (1967-68) they amounted to $18 million, increased to $23 million in 1968-69 and decreased steadily thereafter to $14 million in 1969-70, $12 million in 1970-71 and $7 million in 1971-72. During this period total grants were increasing at a rapid rate so that the .12 ratio of special grants to total grants in 1967-68 (18/144 = .125) has declined to .02 in 1971-72 (7/341 = .02) and unless altered is likely to be close to .01 in 1972-73.

At issue here is whether special grants ought to decline to zero (all funds are formula funds) and if not, what levels of extra support should properly be provided for each type.

For discussion purposes, special purpose extra-formula grants may be conveniently considered under four rubrics: exceptional or major new developments, innovation, continuing support for unusually costly programmes, and quality.

Extra-formula grants have been and are being provided for exceptional development (e.g., emerging universities, new medical schools), innovation (trimester operation at Guelph) and continuing support for special conditions (bilingualism at Ottawa and Laurentian).

It seems reasonable to suggest that bilingualism, once identified as a continuing extra cost for a programme, may simply be reflected in the weight for that particular bilingual programme no matter where it is carried on. Both exceptional development and innovation, which are related, imply that special funds are age-based and as soon as the early life stage has been passed the extra support will dry up. Thus, it seems logical to suggest that there should always be funds which would stimulate desirable new developments and carry them forward to a stage of maturation where they can be financed out of formula funds. The problem arises when the determination must be made about whether the special grants should be allocated from the government level (e.g., for start-up support of medical facilities) or at the university level from formula funds (e.g., development of a special programme in environmental science by a university for which no extra-formula funds are provided). It is fair to say that both government and universities favour having such innovations develop from within the university but this essentially "laissez faire" attitude may not serve the public interest well especially in a period of financial constraints when universities quite naturally retreat to traditional values and traditional programmes.

In expansionary periods when funds flow pretty freely, innovation and developments do take place at universities and are funded out of formula. The fact that old programmes do not die during this period is not so evident but is still a fact. A funds distribution policy appropriate for an expansionary period might justify reduction of special grants distributed at government level; it need not necessarily be appropriate for a contraction period. In a healthy system there is birth and death. Limited new funds flow means new programmes must be funded out of phased-out old programmes. A policy of limited formula funds with no special funds might therefore act as a severe indirect deterrent to healthy innovation.

Well-understood criteria on qualifications necessary for extra support from government for innovation and new developments are required and effort should be devoted to forming guidelines which would spell out generally the types of development and innovation which could expect extra-formula support and which would encourage universities to innovate and develop new programmes out of formula funds simply as a matter of public policy and the necessity to serve well our emerging post-industrial society.

Provision of extra-formula funds for quality is of yet another stripe. The quality of a programme is very much a function of the quality of the resources; output quality is a direct function of input quality. Extra-formula grants could thus be provided specifically for maintenance of a high quality programme as long as an impartial respected outside agency could testify that the quality of a particular programme at a particular university remains so high as to merit support for quality. The university regularly has to make internal quality decisions. In Great Britain, the University Grants Commission provides a portion of operating funds to universities for support of quality.

Again, as with innovation and development, the visibility of need for such support is low during an expansionary period and high in contraction.

One of the problems with providing extra-formula grants for quality is that it will be seen by young emerging institutions and departments as a way of reinforcing the status quo i.e., strong departments at established institutions will tend to remain strong. Also, it may not be possible to get a consensus on one acceptable definition of quality.

It may be quite possible to have <u>too much</u> quality. Not all people can afford the quality of a Rolls Royce. For example, if departmental quality is seen to be highly correlated with the amount and level of graduate work, too many graduate students, by definition, implies too much quality. It may be that some provision

should be made for provincial extra-formula support of outstanding quality at an institution provided there is a demonstrated provincial or national need for such quality which would be compromised if the support were not forthcoming.

6. Separation of certain functions from the formula

The present formula generates "basic operating income" for all operating programmes of the universities based on students enrolled in instructional programmes only. That is, formula financing provides for certain expenditures which are not directly tied to these instructional programmes. Example of such expenditures are in the areas of library, computing, and research overhead.

In order to make the formula more oriented to instructional programme costing, the suggestion has been made to remove some of these difficult expenditure areas from formula financing and fund them by other means. This might allow a more "equitable" distribution of funds under the formula as a better approximation if actual instructional costs could be obtained. However, there would still be a necessity for funding the activities that had been removed from the formula. Grants could be awarded for these activities on the basis of government decision as extra-formula grants are distributed presently. This would obviously increase the percentage of total grants that were extra-formula and would move the university financing process a step back towards a budget review process. In addition, if this required that the special grants be expended in the functional area for which they were designated, it would be contradictory to one of the purposes of the formula - namely, to generate funds without control over their internal distribution within a university.

An alternative method of financing these areas would be by a separate formula. This is the way in which a number of the American formulae work. The needs of each functional area within a university are determined by a different formula. Obviously, this means that the formula system would be much more detailed and complex, and would involve a greater degree of government control. It is not immediately apparent from these jurisdictions that a more complex formula ensures a more equitable distribution of funds.

One of the premises of the original Ontario formula was that it should be kept as simple as possible. It involves much less administrative effort and allows a better understanding of the formula. This is especially true in the situation where actual costs cannot be determined. There does not seem to be any reason at the present time for making the Ontario formula more complex. It is likely, therefore, that a revised formula, for the short term at least, will continue to be a "broad brush" approach encompassing all functional areas of university operation.

7. Trimester and year-round operations

Trimester and year-round operations are of most direct concern to this review by virtue of their impact on financing levels. Year-round operations have indirect effects on universities' financing levels through the incentives or disincentives provided to students to attend in the third semester or to opt for split summer term offerings (two sessions of six weeks each) provided by other universities. It is possible that split-term offerings provide both more flexibility and better opportunity to accelerate programmes. On the financial side, under the present formula it is possible for a university offering the split term to realize 4/5 of appropriate operating income per student (for four full courses of a normal annual load of five) while under the trimester system it would be 1/2 (2 1/2 courses constitute one semester's work).

Are there economies in the year-round operations of universities? What special considerations are necessary in determining the cost of such operations?

In the planning of trimester operations [one form of year-round operation] in the past economies were envisioned in improved "throughput" and therefore less annual cost per student. It was thought that equivalent enrolment in the third term (of three terms of 16 weeks each) would increase throughput by 50% with reduced unit costs. What has happened is that the students have not attended the third term in sufficient numbers to offset the increased financial expenditures in that term. In one case, the University of Pittsburgh went $20 million into debt operating a trimester system in 1965 and was unable to meet staff payrolls.

The increased administrative load of trimester operations should not be discounted. There is an administrative burden to both universities and the government in counting students for financing purposes three times a year instead of once as they are now in most Ontario universities (Guelph is the exception). If all universities were to go on trimester operations the administrative bureaucracies would be bound to increase in size, probably following Parkinson's law.

It has been said that trimester operation cannot be cost-beneficial unless professors are agreeable to increased workload without equivalent additional pay (there must be some marginal return), students attend the third term in substantial proportions or accept that the full range of subject offerings cannot be provided if the proportion is not substantial, and various elements in our society (students, parents, business, government, labour) alter their prevailing attitudes that fall, winter and spring are mainly for work and summer mainly for leisure.

It would be wrong to assume that a failure in 1965 under a certain set of circumstances would be failure in 1975 under a different set. It is possible that proper measures of financial incentives to staff and aid to students combined with changing attitudes of elements of our society toward the times of the year for work, study, and leisure could act together to get viable enrolments in the third term. But, it is unlikely that the whole system could profitably move all at once en masse to year-round operations. Moves in this direction must be very carefully thought out.

Also, if trimester systems are considered to be less costly than traditional systems it is difficult to see how extra-formula support beyond a development period of limited time can be justified.

There are continuing programmes of study by both the Committee on University Affairs and the Council of Ontario Universities. The Joint Subcommittee will welcome the results of their analyses.

8. Role of fees in the formula

The existing operating grants formula recognizes the two major sources of income - tuition fees and government grants - that constitute the main items of revenue for the Ontario universities. Possibly no other feature of present formula financing is more clearly in need of reform than the method of calculating formula fees. In the past standard tuition fees for each programme have been based on the median of actual academic fees collected at the provincially-assisted universities in Ontario rather than the actual fees. (The Government of Ontario has altered the practice recently by unilaterally increasing the standard fee for all undergraduate programmes by $100 and graduate programmes by $400.)

The method of calculation of standard fees has caused some problems that were not foreseen when it was adopted. One university, by changing its actual fees from a level below the median to a point slightly above the median, can raise (and has raised) the median fee, thereby lowering the grants to all universities. The university raising its fees would not gain as much as if it had not affected the median and, depending on the size of the increase, may have a zero net gain. This situation where one university can affect the incomes of the other institutions by a fee increase is not desirable to say the least.

In respect of the fee issue we are essentially looking at two questions. Should fees be included in the calculation of the formula grant? If so, how should they be included?

If fees are excluded from the formula calculation most benefits would accrue to the universities. Unless there were any other direct government controls placed on fees, the university would be permitted to increase or decrease its tuition fees to the level the market would bear. This might result in the rise of one or two elitist universities where students wishing to pay more for better instruction would attend. Freeing fees would provide a university with the ability to increase its revenues when justified for improvements and innovations. It would have the added advantage of avoiding what might be considered by some as political persuasion or influence. The fact that fees form part of basic operating income has been assumed as placing fees under government scrutiny. From the government's point of view, removing fees from the formula and allowing them to fluctuate makes it more difficult for the government to define its level of support.

Let us assume for the purposes of our second question on fees that they are to be included in any revised formula in such a way that the total grants are reduced by the amount of the fees. If actual fees are used in such a calculation, universities might be encouraged to lower their fees towards zero, thereby shifting more of the share of financing from the student to the government. The problem of who should pay and level of support for university operations is outside the scope of the operating grants review, but would certainly enter into formula consideration in this instance. If a standard fee is to be used, such a standard can be set or it can be a function of the actual fees charged by universities. We have mentioned the inherent problems with the median. Similar game-playing would be encouraged by any mathematical calculation of standard fees. The best way to avoid this situation would seem to be to have a standard fee established either by consensus or by government fiat.

Setting a standard fee by consensus and allowing actual fees to fluctuate depending on the policy of the individual universities seems to offer the best advantages to all parties, although further examination of the consequences of different fee policies will be required as part of formula revision.

9. Integration of weights for full-time and part-time students

The need to assign weights under the formula to both part-time and full-time students has meant resolving the considerable differences between disparate systems of part-time teaching in order to arrive at the concept of a full-time equivalent student. Thus far, a full-time undergraduate student has never been precisely defined in a standard way. Part-time students are arbitrarily converted to full-time equivalents by dividing part-time course registrations for each

programme category by a factor of 6. (This factor will change to 5.5 and 5 in 1972-73 and 1973-74 respectively.) Such a system does not necessarily reflect relative costs to the universities of teaching these part-time students.

One attractive proposal that has been raised to overcome this problem as well as to take account of the growing tendency for years of programmes to become less distinct, is a study-unit counting system. Under such a system, each university would assign a total number of study-units or course credits to each of its degree programmes. The varying number of study-units undertaken by a student within an academic year, whether full-time or part-time, would be reported as a percentage of the total need for completion of that degree. For example, University A might consider that it was necessary for a student to complete 32 units to obtain a degree in programme X. Assume that the present weight for programme X is 2.0 per year or a total of 8.0 for the standard 4 years of the programme. If a student takes 6 units toward that degree in a given year, he would generate $6/32 \times 8.0 = 1.5$ BIU's in that year for the university. The following year that student might take 10 units. This would generate $10/32 \times 8.0 - 2.5$ BIU's for the university. All types of students, whether part-time or full-time under the present system, would be subject to the same counting system.

The study-unit counting method has certain obvious advantages. It permits the university to define its own full-time and part-time programmes because each university would specify the units necessary for the completion of the degrees it offers. There would be no necessity to standardize the number of units over all universities. This avoids the problem of having to define full-time and part-time students. Such a system would permit support to the university for actual teaching done. An exceptional student taking additional units in an academic year would generate additional grants. The counting system enables easier integration of part-time course work with full-time programmes - a desirable goal from the government's viewpoint.

Undoubtedly, there are some disadvantages as well. Perhaps the greatest of these is the increased record-keeping that will be necessary to track units which students take. This, in turn, would require an enlarged enrolment audit procedure. In addition, there are some problems of determining the programme of a part-time student where some of the courses which he takes might be basic courses for many programmes.

Despite these disadvantages there seems to be merit in pursuing the development of a study-unit counting system to determine if these disadvantages can be overcome.

10. Changes to the existing pattern of weights

If the revised formula continues to be based on a weighted enrolment system, there are two areas of particular concern: the range of weights and the number of programme categories.

It has been argued by some that since the present formula has operated effectively over the last five years, Ontario universities have adapted their programmes of study to the prevailing range of weights and categories. Therefore, there is little purpose in changing the foundation as any innovations or new programmes can be reasonably fitted into the presently operative eight weighted categories.

As explained by universities that have either developed a financially favourable mix of programmes or by those that have evolved at faster rates than the average university, a change might affect adversely the "reasonable degree of objective quality of grants distribution".

On the other hand we must recognize the many new programmes and innovations in teaching practice and reorganized courses. Other compelling considerations for change would include stabilizing of enrolment at older and larger universities that have not yet completed a decade of their existence as institutions of higher education.

The proponents of the suggestion recommending an increase in the range of weights and categories from eight to perhaps twice as many view the present system as rather "mechanical". They argue that all too many programmes of study are assumed to have uniform cost patterns, that variations in field work, laboratory work, research and other factors cannot be properly reflected in a modest array of weights and categories. Equal support for presumably similar programmes would tend to produce "mediocrity and/or sameness". Unquestionably it would be desirable as an ideal to recognize all variations in cost structure and have this reflected in an equitable formula for distribution of formula grants. But, lacking an extensive cost study and a perfect value system we are restricted to considering available cost study information and implied values that we now have at hand.

One approach favoured by many is to "collapse" the categories and reduce the range of weights. Among some of the reasons for a smaller number of programme categories are the following:

(1) At present we lack an authoritative study of the relative costs of programmes.

(2) Any attempts at fine tuning would have to reflect a large number of assumptions and presumptions which would not only be subject to challenge but also invite varied interpretation of intent.

(3) The steering effects on budgetary allocations within universities would be minimized by reducing the number of categories.

(4) There ought not to be too strong an emphasis at universities to make available only those programmes that provide an economically favourable mix of enrolment.

(5) It would preserve the hope that "a relatively simple pattern of weighted enrolment will produce a reasonable degree of objective equality of grants distribution which will be consistent with a concern for continuing university autonomy".

(6) A smaller range of weights and categories would continue to "reflect roughly the relative costs of the various types of instruction offered" within the limitation that "no exact relationship is possible or necessary".

There are two obvious cases of shifts in programmes which have arisen since the design of the original formula - the disappearance of the distinction between General and Honours programmes, and the merging of undergraduate Arts and Science programmes.

The difference between a General (Pass Degree) and Honours Programme (Honours Degree) has dimmished except for the length of time required to graduate. The earlier contention of "more intensive and in-depth work" requirement for an Honours programme certainly holds true at some universities, but recently there has been a tendency to have a common first year, with second and third year course work more closely related to the subject preference of the particular student.

The University of Toronto has operated an undifferentiated Arts and Science programme since 1969-70. Trent University and several others have either moved to eliminate differences on a limited scale or are planning to do so. A student at an Ontario university has available a large variety of courses which he is permitted to combine with his major field of study. Cost variations in the undergraduate arts and science programmes are therefore no longer as clearly different.

III PROGRAMME OF WORK

The original plan for a programme of work on formula review was to examine those issues capable of a short-run solution. It was thought that the issues of transition to a new formula, development of a revised programme list and new categories, assignment of programme weight by the Delphi method, criteria for special funding, fee standardization, and integration of full-time and part-time weights could have been dealt with effectively through study over a period of 9-12 months. The larger issues of programme costing, economies of scale, separation of functions for separate treatment and new funding methods would have required a much longer study.

With the publication of the Draft Report of the Commission on Post-Secondary Education, COU and CUA agreed that even the short-term review should be suspended until the implications of the Commission's recommendations on future financing of universities become more apparent.

However, the following administrative tasks are to be undertaken despite the deferment of the study:

- a special review of certain areas of complaint, e.g. problems listed in Appendix A.
- definition of procedures and criteria appropriate for dealing with complaints about the formula.
- a document describing the operation of the formula.

APPENDIX A

CATALOGUE OF COMPLAINTS ABOUT PRESENT PROGRAMME WEIGHTS

1. Present formula underweights Social Work (Laurentian, Queen's).
2. " " " Students in School of Translators (Laurentian).
3. " " " Physical Education (Laurentian).
4. " " " Combined Arts and Sciences (Toronto).
5. " " " Library Science.
6. " " " Science (Carleton, Waterloo). Weighting should be raised to Engineering level.
7. " " " Veterinary Medecine (5.0) at Guelph. Should be raised to 6.0.
8. " " " Agriculture (2.0) at Guelph. Should be raised to 3.0.
9. " " " Arts and Sciences (Trent); where they stand alone they should be 1.5.
10. " " " Law (1.5); should be raised to 2.0 and later to 2.5.
11. Why should upper years mathematics students be in category 3? (Brock).
12. Grade 12 entrants to Brock should be funded at some level under formula.
13. Formula overfunds double - summer arrangements in relation to trimester third term (Guelph).
14. Bilingualism requires permanent support either within or outside the formula (Ottawa).
15. The formula must recognize the special circumstances of a university of national stature (U. of T.).
16. Post-doctoral fellows should be funded under formula.